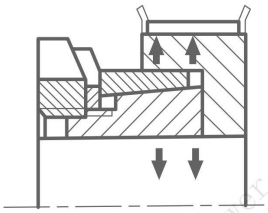
NSPT-LOCKS





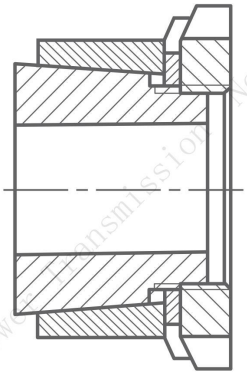
Suitable of Shaft Diameters
Metric:f14～f60(mm)
Inch:5/8"-2 3/8"

HLL NSPT-LOCKS is the extended version of HL type with anti-shock feature. It can transfer larger torques due to its longer length. This type of lock is also designed for connections between small or medium diameter shafts and hubs with high concentricity, low production and operating costs and easy self-installation. The shaft and the inner bore hub are both plain, which makes the machining process easy and economical.

The installation of HLL NSPT-LOCKS is as followed:
Twist the round nut on the inner hub with outer taper surface. Make the nut move axially to press the outer ring with taper bore. The pressures and the frictional forces can then be formed, and the shaft and the hub can be connected without keys or clearance.

HLL type NSPT-LOCKS can be installed with only one round nut. Simply twist the nut to tighten the shaft and the hub, lock the round nut by relevant washer in order to prevent the lock from moving axially and to ensure the torque transmitting efficiency and effectiveness.

Please notice that HLL NSPT-LOCKS can only be installed and used when the dimension B is larger than the axial length of the inner bore of the hub.



Expression of NSPT-LOCK HLL

NL 50 X 60 HLL

- NSPT LOCK HLL
- Out Diameter D
- Bore Diameter d
- NSPT-LOCKS code

HLL NSPT-LOCKS

Conversion:1 inch=25.40mm

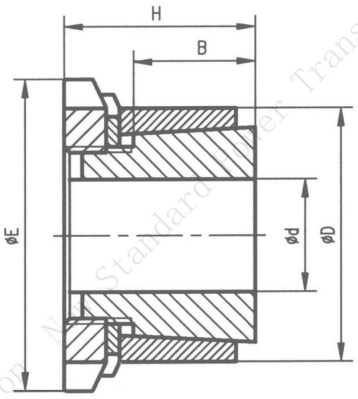
Conversion

1 ft-lbs. = 0.1382 kgf.m = 1.3550 N.m
1 Psi = 0.0007 kgf/mm^2 = 0.0069 Mpa

NSPT-LOCKS

Inches





HLL NSPT-LOCKS

METRIC SIZES INCHES			TOLERANCE INCHES		INCHES			Mt	Axial	pw	pn	LOCKING SCREW	
Size	d		Shaft	Hub	B1	B	E	ft-lb	force lb	psi	psi	Type	Ms ft-lb
14x25	0.551	0.984			1.181	0.787	1.260	47	2025	12325	6525	KM4	70
15x25	0.591	0.984			1.181	0.787	1.260	52	2025	11600	6525	KM4	70
16x25	0.630	0.984	+0/-.001	-0/+.0013	1.181	0.787	1.260	54	2025	10875	6525	KM4	70
17x25	0.669	0.984			1.260	0.787	1.260	59	2025	10150	6525	KM4	70
18x30	0.709	1.181			1.260	0.787	1.496	74	2250	11600	6525	KM5	118
19x30	0.748	1.181	+0/-.0013	-0/+.0013	1.260	0.787	1.496	78	2475	10875	6525	KM5	118
20x30	0.787	1.181			1.260	0.787	1.496	83	2475	10150	6525	KM5	118
22x35	0.866	1.378			1.417	0.984	1.772	121	3150	10150	6525	KM6	163
24x35	0.945	1.378			1.417	0.984	1.772	132	3150	9425	6525	KM6	163
25x35	0.984	1.378	+0/-0013	-0/+.0016	1.417	0.984	1.772	137	3150	8700	6525	KM6	163
28x40	1.102	1.575			1.654	1.181	2.047	185	3825	7975	5800	KM7	252
30x40	1.181	1.575			1.654	1.181	2.047	200	3825	7250	5800	KM7	252
32x45	1.260	1.772			1.732	1.181	2.283	259	4725	8700	6525	KM8	355
35x45	1.378	1.772	+0/-.0016	-0/+.0016	1.732	1.181	2.283	289	4725	7975	6525	KM8	355
38x50	1.496	1.969			1.772	1.181	2.559	370	5850	8700	6525	KM9	503
40x50	1.575	1.969			1.772	1.181	2.559	385	5850	7975	6525	KM9	503
42x55	1.654	2.165			1.811	1.181	2.756	466	6750	9425	7250	KM10	644
45x55	1.772	2.165	+0/-.0016	-0/+.0018	1.811	1.181	2.756	503	6750	8700	7250	KM10	644
48x60	1.890	2.362			1.811	1.181	2.953	622	7875	8700	7250	KM11	718
50x60	1.969	2.362			1.811	1.181	2.953	651	7875	8700	7250	KM11	718
55x65	2.165	2.559	+0/-.0018	-0/+.0018	1.811	1.181	3.150	762	8325	8700	7250	KM12	814
60x70	2.362	2.756			2.047	1.181	3.346	1006	10125	9425	7975	KM13	962

* For unlisted diameters please contact us

Conversion: 1 inch= 25.40mm

Conversion

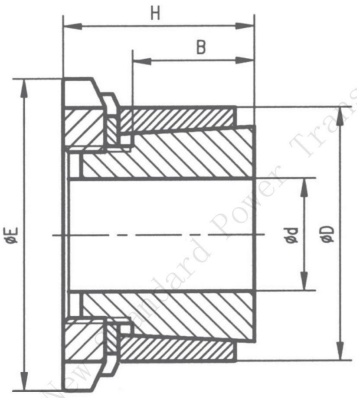
1 ft-lbs. = 0.1382 kgf·m = 1.3550 N.m

1 Psi = 0.0007 kgf/mm² = 0.0069 Mpa

NSPT-LOCKS

Metric





Conversion

1 ft-lbs. = 0.1382 kgf·m = 1.3550 N.m
1 Psi = 0.0007 kgf/mm² = 0.0069 Mpa

HLL NSPT-LOCKS

Catalog	Fundamental dimensions			Locking nut		Rated load		Ps	Ph	G
dxD	H	E	B	Sizes	Ma(N.m)	Ft(Kn)	Mt(Kn.m)	Mpa	Mpa	Kg
CL14x25HLL	30	32	20	M20x1.0	95	9	0.064	85	45	0.11
CL15x25HLL	30	32	20	M20x1.0	95	9	0.07	80	45	0.11
CL16x25HLL	30	32	20	M20x1.0	95	9	0.073	75	45	0.11
CL17x25HLL	32	32	20	M20x1.0	95	9	0.08	70	45	0.13
CL18x30HLL	32	38	20	M25x1.5	160	9	0.091	65	45	0.13
CL19x30HLL	32	38	20	M25x1.5	160	11	0.105	75	45	0.13
CL20x30HLL	32	38	20	M25x1.5	160	11	0.112	70	45	0.15
CL22x35HLL	36	45	25	M30x1.5	220	14	0.163	70	45	0.15
CL24x35HLL	36	45	25	M30x1.5	220	14	0.178	65	45	0.17
CL25x35HLL	36	45	25	M30x1.5	220	14	0.185	60	45	0.17
CL28x40HLL	42	52	30	M35x1.5	340	17	0.25	55	45	0.17
CL30x40HLL	42	52	30	M35x1.5	340	17	0.27	50	45	0.26
CL32x45HLL	44	58	30	M40x1.5	480	21	0.35	60	45	0.26
CL35x45HLL	44	58	30	M40x1.5	480	21	0.39	55	45	0.26
CL38x50HLL	45	65	30	M45x1.5	680	26	0.51	60	45	0.30
CL40x50HLL	45	65	30	M45x1.5	680	26	0.52	55	50	0.33
CL42x55HLL	46	70	30	M50x1.5	870	30	0.63	65	50	0.38
CL45x55HLL	46	70	30	M50x1.5	870	30	0.68	60	50	0.45
CL48x60HLL	46	75	30	M55x2.0	970	35	0.84	60	50	0.51
CL50x60HLL	46	75	30	M55x2.0	970	35	0.88	60	50	0.66
CL55x65HLL	46	80	30	M60x2.0	1100	37	1.03	60	50	0.72
CL60x70HLL	52	85	30	M65x2.0	1300	45	1.36	65	55	0.80

Conversion:1 inch=25.40mm

Key Elements for Designing and Calculation of HL-HLL NSPT-LOCKS

1. Determine max torque and max axial load

$$Mmax = \frac{30000\ H}{p.n} \cdot K(N\ m)$$

$$Fmax = F \cdot K$$

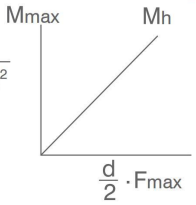
H--Transmission power KW
n--Rotational speed r/min
F--nominal axial force N
K--coefficient needed

Used coefficient sheet for K

No shock load, transmitting with little inertia	1.5–2.5
Slight shock load,transmitting with middle inertia	2.0–4.0
Big shock load, transmitting with heavy inertia	3.0–5.0

2. Calculate synthetic load and transmitted torque

$$Mh = \sqrt{M^2max + (\frac{d}{2} xFmax)^2}$$



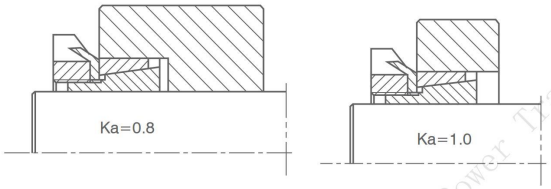
M_{max}--Required transmitted torque Nm
F_{max}--Required transmitted axial force N
M_h--synthetic transmitted torque Nm
d--Transmission shaft diameter mm
M_t--NSPT LOCK rated transmitted torque Nm

$M_t \geqslant M_h$ can be used
$M_t < M_h$ need bigger type of NSPT lock or to be install by two NSPT locks or more together

3. Calculation for the hub diameter

$$Da \geqslant D\sqrt{\frac{\sigma b + Ka \cdot Ph}{\sigma b - Ka \cdot Ph}}$$

Da--outside diameter of hub mm
D--inside diameter of hub mm
Ph--suface pressures on hub Mpa
σb--tensile strength of material
Ka--It should be 0.6 for single NSPT lock, it will be 0.8 when two NSPT locks or more are installed together



4. Calculation for the inside diameter of cannon

$$dB \leqslant d\sqrt{\frac{\sigma b - 2xPs.K3}{\sigma b}}$$

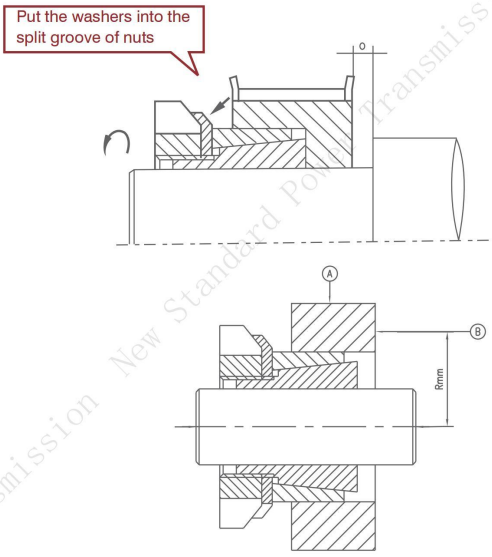
dB--inside diameter of cannon mm
d--outside diameter of cannon mm
6b--tensile strength of shaft material Mpa
Ps--pressure on the surface of shaft Mpa
K3--coefficient=0.6

5. Settlement for the surface roughness and dimension tolerance

Fittng Section	Ra(um) Surface Roughness	Dimension Precision
Shaft Diameter d	1.6	h8–H9
Bore Diameter D	1.6	H8–H9

6. Installation and disassembling for NSPT lock type HL,HLL

Installation:
Before installation, clean up oil or dust so that torque transmission won't be affected. Loosen the round nut and keep it relaxed. Meanwhile, install hub and shaft and NSPT lock in the right positions. For step shaft, the short distance "o" should be deep and data for "o" should have data larger than the distance in axial while the NSPT lock is tightened. Tighten the round nut in clockwise direction to reach the specified torque. The round nut should be eventually locked with the washer.



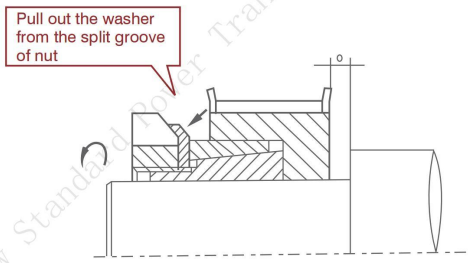
After the correct installation mentioned above inspect the runout for Ⓐ and Ⓑ. The run out for Ⓐ should not excess 0.05mm and 0.02mm for Ⓑ.

Conversion:1 inch=25.40mm

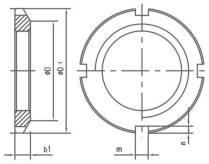
Conversion

1 ft-lbs. = 0.1382 kgf·m = 1.3550 N.m
1 Psi = 0.0007 kgf/mm² = 0.0069 Mpa

Disassembling :
To disassemble, open and loosen the locked washer the roundnut. The NSPT lock will be separated from the shaft and hub, and then return to its original shape.

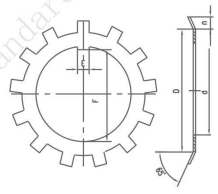


Dimension table of split round nuts



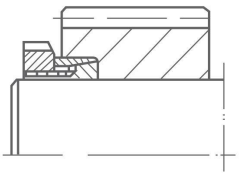
Catalog	Fundamental Dimensions				
	D_1	b_1	D	m	n
M20x1	32	6	26	4	2
M22x1	35	7	29	5	2
M25x1.5	38	7	32	5	2
M30x1.5	45	7	38	5	2
M32x1.5	48	7	41	5	2
M35x1.5	52	8	44	5	2
M36x1.5	55	9	47	6	2.5
M40x1.5	58	9	50	6	2.5
M42x1.5	62	10	52	6	2.5
M45x1.5	65	10	56	6	2.5
M48x1.5	68	11	58	6	2.5
M50x1.5	70	11	61	6	2.5
M55x2	75	11	67	7	3
M60x2	80	11	73	7	3
M65x2	85	12	79	7	3
M70x2	92	12	85	8	3.5
M75x2	98	13	90	8	3.5

Dimension table of stop backing washers

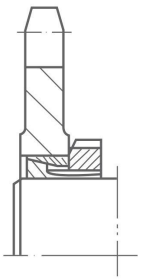


Catalog	Fundamental Dimensions					
	d	D	S	n	F	E
20	20.5	26	1	4	19	4
25	25.5	32	1.25	5	24	5
30	30.5	38	1.25	5	28	5
35	35.5	44	1.25	6	33	5
40	40.5	50	1.25	6	38.5	6
45	45.5	56	1.25	6	43	6
50	50.5	61	1.25	6	48	6
55	55.5	67	1.25	8	53	7
60	60.5	73	1.5	8	58.5	7
65	65.5	79	1.5	8	63	7
70	70.5	85	1.5	8	68	8
75	75.5	90	1.5	8	73	8

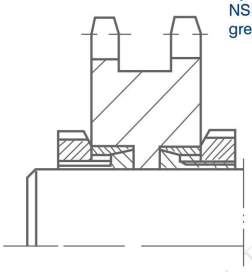
Conventional installation with non-through bored hubs



Conventional installation with through bored hubs



Symmetrical installation of paired NSPT-LOCKS on both sides for greater power transmission



Installed with counter bored hubs. The NSPT-LOCKS can be completely installed into the hub to save space.

